HDBaseT Compact Extender Set 70m User Guide

Model HDBaseT-C.tx70 and HDBaseT-C.rx70

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Version This document applies to HDBaseT Compact Extender Set 70m, Model HDBaseT-C.tx70 and HDBaseT-C.rx70.

Contact information For contact information, see www.clarecontrols.com.

FCC compliance This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC compliance **Class A:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.

FCC compliance

Class B: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

There is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

EU compliance

CE

Complete additional sections according to the governing laws and standards for the intended marketplace.

EU directives

1999/5/EC (R&TTE directive): Hereby, Clare Controls, Inc. declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

2002/96/EC (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: www.recyclethis.info.

2006/66/EC (battery directive): This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling, return the battery to your supplier or to a designated collection point. For more information see: www.recyclethis.info.

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Safety precautions

Read all instructions carefully before using the device. Save this manual for future reference.

- Unpack the equipment carefully. Save the original box and packing material for future shipping.
- Follow basic safety precautions to reduce the risk of fire, electrical shock, and injury to persons.
- Do not open or modify the device; it may result in electrical shock or burn.
- Only use parts that meet the device's specifications. If you use parts that do not match, it may cause damage to the device.
- Only qualified professionals should service this product.
- Do not expose this device to rain, moisture, or any form of liquid to avoid fire or shock damage. If exposure occurs, unplug the device immediately.
- Do not use liquid or aerosol cleaners on this unit. Always unplug the power to the device before cleaning.
- Do not disrupt the cables or power source of the device.
- Install the device in a ventilated area to avoid overheating.
- Do not twist or use force to pull the optical cable, this can cause damage or malfunction in the device. .
- Do not leave this device plugged in unused for long periods.
- Do not burn or mix this device with general household waste. Treat the device as electrical waste

Caution: The HDBaseT-C.tx70 and HDBaseT-C.rx70 must be used as a pair. Do not use the HDBaseT-C.rx70 separately or in combination with HDBaseT switches, as using it may cause damage to the unit.

Limitation of liability

To the maximum extent permitted by applicable law, in no event will Clare Controls, Inc. be liable for any lost profits or business opportunities, loss of use, business interruption, loss of data, or any other indirect, special, incidental, or consequential damages under any theory of liability, whether based in contract, tort, negligence, product liability, or otherwise. Because some jurisdictions do not allow the exclusion or limitation of liability for consequential or incidental damages the preceding limitation may not apply to you. In any event the total liability of Clare Controls, Inc. shall not exceed the purchase price of the product. The foregoing limitation will apply to the maximum extent permitted by applicable law, regardless of whether Clare Controls, Inc. has been advised of the possibility of such damages and regardless of whether any remedy fails of its essential purpose.

Installation in accordance with this manual, applicable codes, and the instructions of the authority having jurisdiction is mandatory.

While every precaution has been taken during the preparation of this manual to ensure the accuracy of its contents, Clare Controls, Inc. assumes no responsibility for errors or omissions.

Introduction

The extender set consists of a transmitter and receiver pair. HDMI signals are input into the transmitter and HDBaseT technology is used to transmit the signals to the receiver up to 230 ft. (70 m) via a Cat5e/Cat6 cable. The receiver then outputs the HDMI signal.

Bi-directional IR is also transmitted across the Cat5e/Cat6 cable. The extender set supports CEC, and IR control, and PoH (Power Over HDBaseT), which can be used to power the receiver via the Cat5e/Cat6 cable. This eliminates the need for power at the receiver end.

Features

- Supports full HD: Delivers high-resolution images (1080p at 60 Hz, 3D, 4K × 2K at 30 Hz)
- Maximum transmission distance is 230 ft. (70 m) over single a CAT5e/CAT6 cable, or 40 meters for 4Kx2K at 30 Hz
- High bandwidth: 10.2 Gbps
- HDTV compatible: Uses HDMI 1.4 and is HDCP-2.2 compliant
- Support PoH (Power Over HDBaseT) and CEC
- Uses HDBaseT technology for extended capability and reliability
- Bi-directional IR.
- LED indicators show working status to aid in troubleshooting
- Wall or table mount steel enclosure

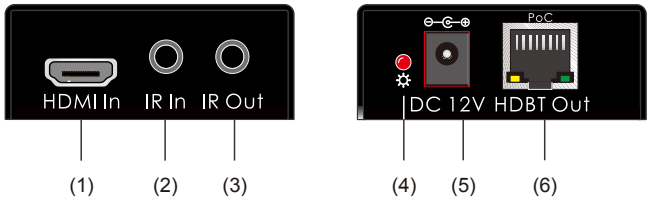
Package contents

- 4 x detachable mounting brackets
- 8 x plastic cushions
- 4 x screws
- 1 x power supply (12 VDC)
- 4 x power plug adapters
- 1 x user manual
- 1 x IR emitter
- 1 x IR receiver
- 1 x IR adapter cable

Notes: Ensure all the accessories are included. If not, contact your dealer.

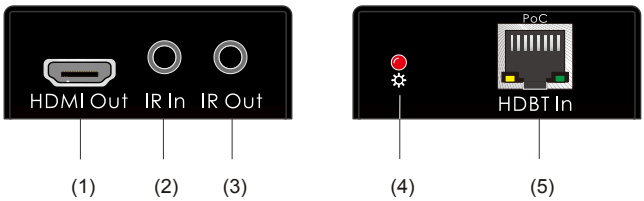
Product appearance

Figure 1: The HDBaseT-C.tx70 transmitter



(1) HDMI IN:	Connect to the HDMI source device.
(2) IR IN:	Connects to an IR receiver. The IR signal received from this port will be transmitted via HDBaseT to the transmitter unit for use at the source location. **Note:** When using a control system, such as Clare Controls, the adapter cable (included) must be used. The male mono end connects to the control system; the male stereo end connects to the HDBaseT-C.tx70.
(3) IR OUT:	IR signals received by receiver and sent via HDBaseT to the transmitter are available for emitter use from this port.
(4) Power LED:	Illuminates when the device is receiving power.
(5) DC 12V:	Connects to the power supply
(6) HDBT OUT:	Connects via a single Cat5e/Cat6 cable to the HDBaseT port on the receiver.

Figure 2: The HDBaseT-C.rx70 receiver



(1) HDMI OUT:	Connect to the HDMI display device.
(2) IR IN:	Connects to an IR receiver. The IR signal received from this port is transmitted via HDBaseT to the HDBaseT-C.tx70 unit for use at the source location.
(3) IR OUT:	IR signals received by the HDBaseT-C.tx70 and sent via HDBaseT to the HDBaseT-C.rx70 are available for emitter use from this port.
(4) Power LED:	Illuminates when the device is receiving power.

(5) HDBT IN	Connects via single Cat5e/Cat6 cable to the HDBaseT port in the HDBaseT-C.tx70.

System connection

Usage precautions

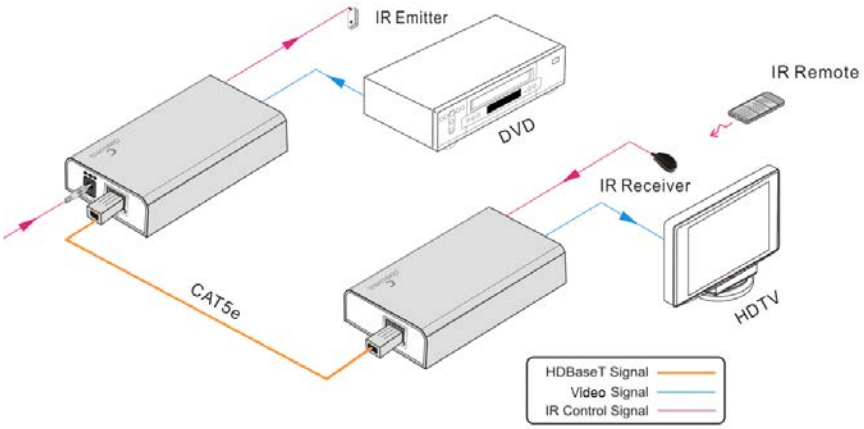
- The system should be installed in a clean environment and have proper temperature and humidity controls.
- All of the power switches, plugs, sockets, and power cords should be insulated for safety.
- All devices should be connected before powering on.
- The Cat5e/Cat6 terminations for HDBaseT devices should be a straight-thru TIA/EIA T568B standard.

Application examples

The HDBaseT-C.rx70 receiver works in conjunction with the HDBaseT-C.tx70 transmitter. By transmitting signals across reliable Cat5e/Cat6 cables, the video signal can be used at far greater distances from the source device than would be capable with traditional HDMI cables. Additionally, control signals can be sent bi-directionally across the same Cat5e/Cat6 cable. The following figures show you some application examples for the HDBaseT-C.tx70 and HDBaseT-C.rx70.

Note: When using a control system, such as Clare Controls, Crestron, or URC, the 3.5 mm male mono to 3.5 mm male stereo adapter cable (included) must be used. The male mono end connects to the control system; the male stereo end connects to HDBaseT-C.tx70.

Figure 3: System connection



Connection procedure

To connect the HDBaseT Compact Extender Set 70m:

1. Connect HDMI from the source (such as Blu-ray DVD) to the HDMI IN port of the transmitter using an HDMI cable.
2. Connect the HDBT OUT port of the HDBaseT-C.tx70 to the HDBT IN port of the receiver with a single CAT5e/CAT6 cable using TIA/EIA T568B terminations at each end.
3. Connect the HDMI OUT port of the HDBaseT-C.rx70 to an HDMI in port on the display using an HDMI cable.
4. When using the bi-directional IR control, do the following.
   a. Connect the IR emitter at either end to the IR TX port on either the HDBaseT-C.tx70 transmitter or the HDBaseT-C.rx70 receiver.
   b. When using a powered IR receiver, connect via a 3.5 mm stereo plug to the IR RX on either the HDBaseT-C.tx70 transmitter or the HDBaseT-C.rx70 receiver.
   c. When using a control system to send IR signals, you must use the included 3.5 mm male mono to 3.5 mm male stereo adapter cable (included) must be used. The male mono end connects to the control system; the male stereo end connects to HDBaseT-C.tx70.
5. Connect the 12 VDC power adapter to the power port on the HDBaseT-C.tx70 transmitter. The HDBaseT-C.rx70 receiver is powered through PoH.]

Application

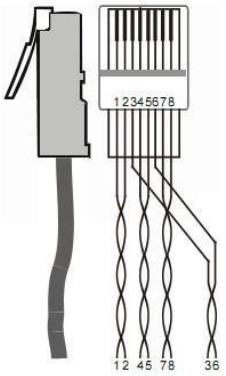
The HDBaseT-C.tx70 and HDBaseT-C.rx70 extender pair is useful in any scenario when an HDMI signal (along with control signals) must be transmitted reliably across greater distances than is practical using traditional HDMI cables. They may be used in both residential and commercial applications when centrally locating the source equipment and displaying HD video in remote locations.

Twisted pair cable connection

The Cat5e/Cat6 terminations for HDBaseT devices should be a straight thru TIA/EIA T568B standard. TIA/EIA T568A standard is NOT recommended.

Table 1: T568B cable standards

TIA/EIA T568B	
Pin	**Cable color**
1	orange white
2	orange
3	green white
4	blue
5	blue white
6	green
7	brown white
8	brown



1st Ground	4-5
2nd Ground	1-2
3rd Group	3-6
4th Group	7-8

Note: RJ45 EZ connectors should not be used at any time.

Specifications

	HDBaseT-C.tx70 transmitter	HDBaseT-C.rx70 receiver
Input		
Input signal	1 HDMI and 1 IR	1 RJ45 and 1 IR
Input connector	HDMI female and 3.5 mm mini jack	3.5 mm mini jack and RJ-45
Video signal	HDMI1.4	HDMI1.4
Audio	Digital audio, transmit through HDMI audio	Digital audio, transmit through HDMI audio
Output		
Output	1 RJ45 and 1 IR	1 HDMI and 1 IR
Output connector	3.5 mm mini jack and RJ45	HDMI female and 3.5 mm mini jack
Video signal	HDMI 1.4	HDMI 1.4
Transmission mode	HDBaseT	HDBaseT
General		
Resolution range	600 x 480 at 60 Hz to 4Kx2K at 30 Hz	
Transmission distance	Maximum distance 230 ft. (70 m), 1080p 60 Hz, 4Kx2K at 30 Hz (40 m)	
Gain	>70 dB at 100 MHz to 100 M	
Bandwidth	10.2 Gbps	
THD	< 0.005% at 1 KHz	
HDMI standard	Support HDMI 1.4 and HDCP	
Impedance	75 Ω	
Temperature	14 to 104ºF (-10 to +40ºC)	
Humidity	10% to 90%	
Power supply	12 VDC 1A	
Power consumption	9.6 W	
Case dimension (W × H × D)	4.7 × 1.0 × 2.4 in. (120 × 26 × 61 mm)	4.7 × 1.0 × 2.4 in. (120 × 26 × 61 mm)
Net weight	.61 lb. (0.28 Kg)	.61 lb. (0.28 Kg)

Note: All nominal levels are at ±10%.

Supported resolution

Display Ration	**Resolution**	**HDMI**	**DVI**
4K x 2K	4096 × 2160 at 30 Hz	Yes	
	3840 × 2160 at 24 Hz	Yes	
	3840 × 2160 at 25 Hz	Yes	
	3840 × 2160 at 30 Hz	Yes	
16:9	1920 × 1080 at 60 Hz	Yes	No
	1600 × 900 at 60 Hz	Yes	
	1366 × 768 at 60 Hz	Yes	
	1280 × 720 at 60 Hz	Yes	No
	1024 × 576 at 60 Hz	Yes	
16:10	1920 × 1200 at 60 Hz	Yes	No
	1680 × 1050 at 60 Hz	Yes	
	1440 × 900 at 60 Hz	Yes	
	1360 × 768 at 60 Hz	Yes	
	1280 × 800 at 60 Hz	Yes	
4:3	1600 × 1200 at 60 Hz	Yes	No
	1400 × 1050 at 60 Hz	Yes	
	1280 × 1024 at 60 Hz	Yes	No
	1024 × 768 at 60 Hz	Yes	No
	800 × 600 at 60 Hz	Yes	No
	640 × 480 at 60 Hz	Yes	No

Note: The HDBaseT-C.tx70 and HDBaseT-C.rx70 supports 4K and1080p 3D HDMI signal. Use HDMI cables compliant with HDMI1.4.

Panel drawings

Figure 4: HDBaseT-C.tx70 transmitter

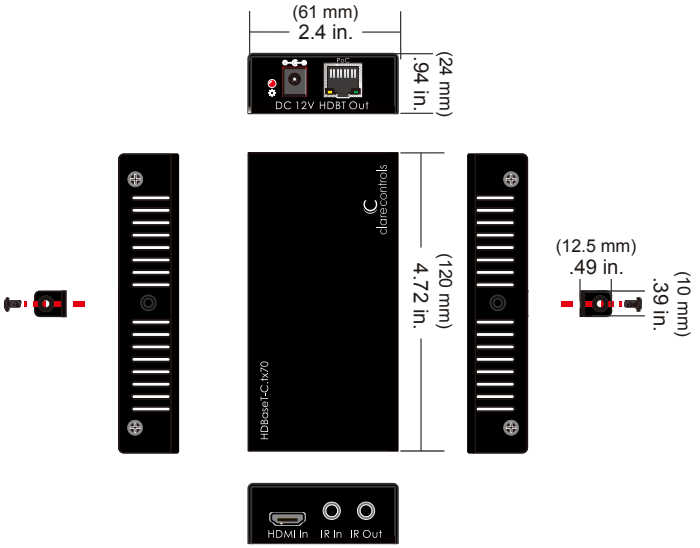
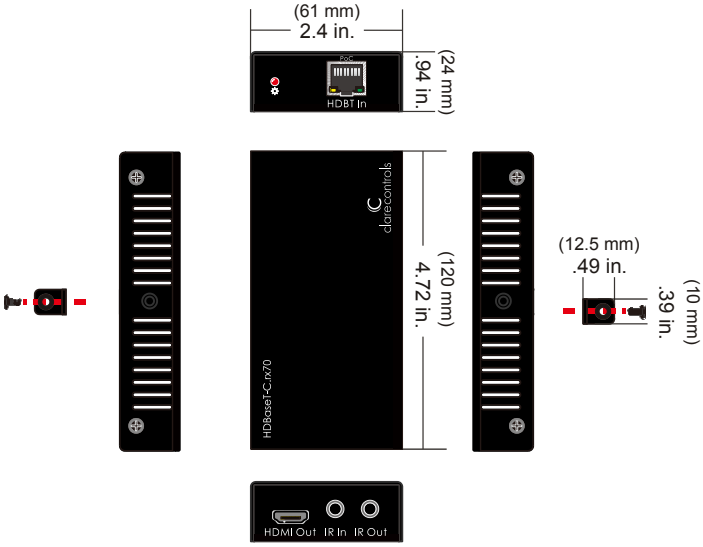


Figure 5: HDBaseT-C.rx70 receiver



Troubleshooting and maintenance

- No image on display:
  - Ensure that the display device has been set to the correct input.
  - Ensure that the HDMI cables used for both the source/transmitter and the receiver/display are properly connected and are working. Test the HDMI cables directly from a source to display and ensure their operation.
  - Ensure that the Cat5e/Cat6 cable has not been damaged and that it has been terminated correctly with T568B on both ends. A temporary length of Cat5e/Cat6 can be used for testing to ensure that the devices are all compatible and working properly.
  - Ensure proper grounding of the power supply.
- Color loss or poor picture quality:
  - Ensure that the HDMI cables used for both the source and transmitter and the receiver and display are properly connected and are of good quality. Test the HDMI cables directly from a source to display and ensure their picture quality.
  - Ensure proper grounding of the power supply.
  - If the static becomes stronger or picture quality becomes worse when connecting the video connectors, this may be due to improper grounding.
  - Check the grounding and make sure all the components are properly grounded to a common ground. Improper grounding may cause damage to the receiver.
  - IR signal problems:
    - When using a control system such as Clare Controls, the 3.5 mm male mono to 3.5 mm male stereo adapter cable (included) must be used. The male mono end connects to the control system; the male stereo end connects to HDBaseT-C.tx70.

Safety operation

To guarantee the reliable operation of the equipment and personal safety, please follow the procedures listed below.

- The system must be grounded properly. Do not use two blades plugs. Ensure the supply voltage is in the correct range of 100 to 240 VAC, 50/60 Hz.
- Do not place the device in a place that is abnormally hot or cold or does not have proper temperature control and ventilation.
- The HDBaseT-C.tx70 and HDBaseT-C.rx70 generate heat when operating. The environment should be well ventilated to prevent damage caused by overheating.
- Disconnect power in humid weather, or when left unused for long periods.
- Before making or removing any connections to the device, ensure that the power supply has been disconnected.
- Do not attempt to open the enclosure of the equipment. Do not attempt any repairs. There are no user-serviceable parts inside. Any attempt to open the equipment will result in a complete void of any warranty and may result in serious injury or death.
- Do not splash any chemical substances or liquids on or around the equipment.

After-sales service

- If there appears to be problems when using the device(s), refer to the “Troubleshooting and maintenance” section in this manual. Return shipping costs are not covered by this warranty.
- You can contact Customer Support at http://support.clarecontrols.com. Please be ready to provide the following information.
    - Product model number, version and serial number.
    - Detailed description of the trouble issues.
    - Description of all connections and third-party equipment being used.
- We offer this product with a three-year warranty, which starts from the first day you purchase this product.
- If, during the warranty period, the unit cannot be repaired, a suitable replacement will be issued. Replacement units will be comparable to the original. However, due to potential design changes over time, replacement units may not be identical to the unit replaced.
- Items not covered by this warranty.
    - Damage caused due to incorrect usage and/or connections.
    - Damage caused due to installation by person(s) not adequately trained in the installation of this equipment.
    - Any attempt to open this unit and access internal components shall immediately void this warranty.
    - Damage caused by any physical force (dropping the unit or dropping an object upon the unit, etc.).
    - Damage caused by voltage or cycle fluctuations outside acceptable range.
    - Damage caused by over-current, voltage spikes, or lightning damage due to inadequate surge protection.
- A valid invoice of purchase via an authorized dealer shall be required for any warranty coverage.